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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/510,861	02/23/2000	Koichi Tamura	13392	4715
23389	7590	02/04/2005	EXAMINER	
SCULLY SCOTT MURPHY & PRESSER, PC			FAN, CHIEH M	
400 GARDEN CITY PLAZA			ART UNIT	
GARDEN CITY, NY 11530			PAPER NUMBER	
			2634	

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/510,861

Applicant(s)

TAMURA, KOICHI

Examiner

Chieh M Fan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 9/23/04, 11/22/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 and 25-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 15-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/23/2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

This Office Action is in response to the Request for Continued Examination (RCE) filed on 11/22/2004, which in turn enters the amendment filed 9/23/2004.

### ***Claim Objections***

1. Claims 1-10 and 15-24 are objected to because of the following informalities:

Regarding claim 1, it is suggested changing "a A/D converting means" in line 2 to --- an analog-to-digital (A/D) converting means ---; and changing "a P/S conversion" in line 11 to --- a parallel-to-serial (P/S) conversion ---. Further, "and prior to a P/S conversion of said known signal" in line 11 should be changed to --- and prior to a P/S conversion and said known signal --- so as to be consistent with previous version of claim 1 (dated 3/19/04).

Regarding claim 3, it is suggested changing "a A/D converting means" in line 2 to --- an analog-to-digital (A/D) converting means ---; and changing "P/S converter" in line 12 to --- parallel-to-serial (P/S) converter ---.

Regarding claim 15, it is suggested changing "a A/D converting means" in lines 2-3 to --- an analog-to-digital (A/D) converting means ---; and changing "P/S conversion" in line 8 to --- parallel-to-serial (P/S) conversion ---.

Regarding claim 17, it is suggested changing "a A/D converting means" in line 2 to --- an analog-to-digital (A/D) converting means ---; and changing "a P/S converter" in line 11 to --- a parallel-to-serial (P/S) converter ---.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 6-8 and 20-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement and/or written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claims 6-8, it appears that the claimed "a second comparison means for compares each of the results from said comparison means for N times" in the last two lines of claim 6 does not have written support. It appears the claimed "a comparison means compares said known signal after digital conversion by said A/D converting means and said known signal inserted at transmission" in lines 4-6 is referred to the step S13 in Fig. 5. However, Fig. 5 never shows a second comparison means that compares each of the results from the said comparison for N time. If the

second comparison means is intended for the step S15, the examiner suggests changing the limitation to --- a second comparison means for compares each of the N results from said comparison means ---.

Regarding claims 20-22, claim 20 recites in step (d) the limitation similar to “ a second comparison means” above, and are rejected for the same reason.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 3 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Fujii et al. (U.S. Patent No. 5,991,344, cited in previous Office Action dated 11/17/03, “Fujii” hereinafter).

Regarding claim 3, Fujii teaches a demodulation circuit (250, 270 through 157, 158 to 210 in Fig. 1) for demodulating a digital transmission signal having improved power consumption for an A/D converting means further comprises orthogonal demodulating means (156 in Fig. 1) for performing orthogonal demodulation of said digital transmission signal,

said A/D converting means includes two A/D converters (157, 158 in Fig. 1) for two base band signals demodulated by the orthogonal demodulation means,

symbol judgment portion (213 in Fig. 1) for making judgment of symbols of digital signals output from the A/D converters,

said phase shifting means including P/S converter (214 in Fig. 1) for converting the output signal of the symbol judgment portion, comparing portion (230 in Fig. 1; note that 230 is a unique word detector; also note that in order to detect the UW, it is inherent a comparison needs to be made between the received signal with the UW stored somewhere at the receiver) for comparing the known signal extracted from the output signal of the P/S converter with the known signal inserted at the transmitting end, and a phase shifter for causing phase shift of the base band signal before digital conversion by said A/D converting means on the basis of a result of comparison by the comparing portion (220 in Fig. 1; note that, as shown in Fig. 1, the controller 220 sends a control signal to the VCO 164, which in turn controls the phase of the demodulators 270, 280 and 156; also note that the phase is controlled or adjusted before the A/D converting means).

Claim 17 is the corresponding method claim of claim 3, and is therefore rejected for the same reason above.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. (U.S. Patent No. 5,991,344) in view of Miya et al. (U.S. Patent No. 5,572,516, cited in previous Office Action dated 11/17/03, "Miya" hereinafter).

Regarding claims 4 and 18, Fujii teaches the claimed invention (see the rationale applied to claims 3 and 17 above), but does not teach reception data processing portion obtaining an information data by removing the known signal.

Miya teaches a frame decomposition circuit (124 in Fig. 1) that reproduces the information by removing the unique word (col. 6, lines 28-32).

It is known that the unique word does not contain any information and is generally only used for synchronization purpose. It is therefore required to remove the unique word from the received signal in order to obtain the information. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a reception data processing portion that removes the known signal to obtain the information data, since the known signal does not contain any information.

8. Claims 1, 2, 5, 9, 15, 16, 19 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tarallo (U.S. Patent No. 4,879,728) in view of Horii et al. (WO 98/56148, "Horii" hereinafter; an equivalent U.S. Patent No. 6,693,978 is also cited as translation).

Regarding claim 1, Tarallo teaches a demodulation circuit (see Fig. 1) for demodulating a digital transmission signal having improved power consumption levels and sampling frequency for an A/D converting means wherein

a known signal is inserted in said digital transmission signal at transmission (lines 13-15 of abstract; col. 8, lines 30-34),

said demodulation circuit comprising: said A/D converting means (115-1, 115-2 in Fig. 1) for performing A/D conversion of a base band signal obtained by demodulation (101-1, 130, 101-2, 105-1, 105-2 in Fig. 1) of said digital transmission signal; and phase shifting means (155 in Fig. 1) for repeatedly varying a phase shift of one of said digital transmission signal and said base band signal before digital conversion by said A/D converting means on the basis of a comparison between said known signal after digital conversion by said A/D converting means and said known signal that was inserted at transmission (col. 4, line 66 through col. 5, line 2; lines 11-25 of abstract; col. 8, lines 30-34; also note that, as shown in Fig. 1, the AFC 155 sends a control signal to the local oscillator 125, which in turn controls the phase of the demodulator 110, 130; also note that the phase is controlled or adjusted before the A/D converting means 115).

Tarallo does not particularly teach a parallel-to-serial (P/S) conversion that occurs after the comparison. However, such P/S conversion is well known in the art to convert the I and Q components into one output symbol. Horii teach an analogous demodulator that comprise a P/S converter (123 in Fig. 5) that converts the I and Q components into a serial data output. As the symbol decision circuit (145 in Fig. 1) of Tarallo receives the I and Q components and generates one output signal, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that a P/S conversion means, as shown by Horii, is within the symbol decision circuit 145 to facilitate the generation of output symbol.

Regarding claim 2, the demodulation circuit of Tarallo further comprises orthogonal demodulating means (101-1, 130, 101-2 in Fig. 1), A/D converting means including two A/D converters (115-1, 115-2 in Fig. 1), symbol detecting means (140 in Fig. 1), wherein the phase shifting means including comparing portion (320 in Fig. 3) and a phase shifter for causing phase shift of said base band signal (the AFC 155 sends a control signal to the local oscillator 125, which in turn controls the phase of the demodulator 110, 130 and thereby controls the phase of the base band signal).

Regarding claim 5, the demodulation circuit of Tarallo further comprises orthogonal demodulating means (101-1, 130, 101-2 in Fig. 1), A/D converting means including two A/D converters (115-1, 115-2 in Fig. 1), symbol detecting means (140 in Fig. 1), wherein the phase shifting means including comparing portion (320 in Fig. 3) and a phase shifter for causing phase shift of said digital transmission signal. (See 155 in Fig. 1; also note that, in col. 4, lines 47-50, Tarallo indicates that while a baseband

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operation is illustrates, it is understood that the same principle may be to operation at an intermediate frequency band other than baseband. It is therefore clear that the phase may be also controlled or shifted at the frequency other than base band.)

Regarding claim 9, since the known signal of Tarallo is located in the preamble, the claimed "time multiplexed" is met.

Regarding claim 15, claim 15 is the corresponding method claim of claim 1, and is therefore rejected for the reason applied to claim 1 above.

Regarding claim 16, claim 16 is the corresponding method claim of claim 2, and is therefore rejected for the reason applied to claim 2 above.

Regarding claim 19, claim 19 is the corresponding method claim of claim 5, and is therefore rejected for the reason applied to claim 5 above.

Regarding claim 23, claim 23 is the corresponding method claim of claim 9, and is therefore rejected for the reason applied to claim 5 above.

9. Claims 10 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tarallo (U.S. Patent No. 4,879,728) in view of Horii et al. (WO 98/56148, "Horii" hereinafter) as applied to claims 1 and 15 above, and further in view of Odenwalder et al. (U.S. Patent No. 6,480,521, cited previously) and Sawahashi et al. (U.S. Patent No. 5,694,388, cited previously).

Tarallo in view of Horii teach the claimed invention (see the rationale applied to claims 1 and 15 above), but does not teach that the information data is transmitted in one of the I and Q channels and the known signal is transmitted in the other of the I and

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Q channels. However, it is common in the art that the known signal, such as pilot signal, unique word etc., and the information data are transmitted at separate channels.

Odenwalder et al. teach that the pilot signal may be transmitted solely on either the I or Q channels (col. 8, lines 55-56). Sawahashi et al. teach transmitting the pilot signal and the information data on separate channels (Fig. 12). The pilot signal is transmitted continuously on the pilot channel to achieve good tracking ability to the Rayleigh fading (col. 29, lines 17-21). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to transmit the information data on one of the I and Q channels, and transmit the known signal on the other of the I and Q channels, so as to achieve good tracking ability on the Rayleigh fading.

### ***Conclusion***

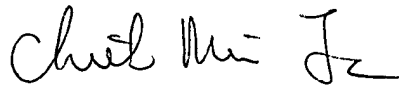
10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ishizawa (U.S. Patent No. 5,905,405), Sato et al. (U.S. Patent No. 5,596,582).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (571) 272-3042. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in cursive script, appearing to read "Chieh M Fan".

Chieh M Fan  
Primary Examiner  
Art Unit 2634

January 26, 2005